**Karunya University**

**(Karunya Institute of Technology and Sciences)**

(Declared as Deemed to be University under Sec.3 of the UGC Act, 1956)

**Supplementary Examinations – June 2016**

**Subject Title: BASIC MATHEMATICS TO ENGINEERING Time : 3 hours**

**Subject Code: 13MA201 Maximum Marks: 100**

**Answer ALL questions (5 x 20 = 100 Marks)**

1. a. If  then prove the following (4)

i.  ii. .

b. Prove the identity. (8)

c. Resolve  into partial fractions. (8)

**(OR)**

2. a. Prove the identity. (6)

b. Resolve  into partial fractions. (8)

c. Expand using Binomial theorem (8)

3. a. Differentiate the following . (10)

i. Find  ii. If  , find .

b. Integrate . (10)

**(OR)**

4. a. If , prove that . (10)

b. Integrate . (10)

5. a. Expand  in Taylor’s series about . (6)

b. If , where , find  (6)

c. If , and . Evaluate . (8)

**(OR)**

6. a. If , show that . (6)

[P.T.O]

b. If  find . (4)

c. Expand about  using Taylor’s series upto third degree terms. (10)

7. a. If , and  then find (6) i.  ii. .

b. Find the angle between the vectors  and . (6)

c). Find the vector and Cartesian equation of the plane passing through (2,-1,1) and (1,4,5) and parallel to the vector . (8)

**(OR)**

8. a. Find the projection of the vector  on . (4)

b. If the points (3,2,-4), (9,8,-10) and  are collinear, then find . (6)

c. Show that the lines  and are skew lines and find the shortest lines between them. (10)

**Compulsory:**

9. a. Solve the system of equations by Cramers method. (8)



b. Find the eigen values and eigen vectors of . (12)